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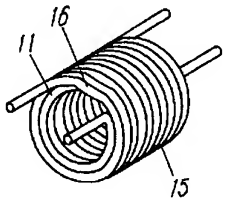
(54)【発明の名称】　コイル部品

(57)【要約】

【課題】　本発明はコイル部品に関するものであり、バイファイラ巻された円形ソレノイドコイルにおいて接着剤等を用いずにコイルの引出し位置を固定することを目的とするものである。

【解決手段】　円形ソレノイド状に巻回された第１の巻線１１とその上に巻回された第２の巻線１５において、それぞれ巻線の少なくとも一部分の同位置に互いに接触するように巻線径より大きいＲを持つ弧または直線部分１４，１６を設けたコイル部品を構成することにより、接着剤等を用いずにコイルの引出し位置を固定できるものである。

11　第1の巻線
15　第2の巻線



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【特許請求の範囲】

【請求項１】　円形ソレノイド状に巻回され少なくとも一部分に巻線より大きいＲを持つ弧または直線部分を設けた第１の巻線、この第１の巻線の上に巻回され第１の巻線の弧または直線部分に接触するよう巻線径より大きいＲを持つ弧または直線部分を設けた第２の巻線からなるコイル部品。

【請求項２】　第１の巻線の上に第２の巻線を俵巻した請求項１に記載のコイル部品。

【請求項３】　請求項１に記載の第１の巻線と第２の巻線の内側に挿入され上記２つの巻線のコイル引出し部分が同時に接触する回転方向に平行な平面を設けたボビンと、このボビンの内側に挿入される磁心からなるコイル部品。

【請求項４】　請求項３に記載の第１、第２の巻線にボビンと磁心を組込んだものと嵌合するケースからなるコイル部品。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明はノイズフィルタ等に用いられるコイル部品に関するものである。

【０００２】

【従来の技術】従来の技術を図２２、図２３および図２４によって説明する。

【０００３】まず、図２２（ａ），（ｂ），（ｃ）によると、円形ソレノイド状に巻線された第１の巻線１の上に同じく円形ソレノイド状に巻線された第２の巻線２によって構成された１組のコイル部品であり、３は第１、第２の巻線１，２間の回転を防止するための接着剤である。ここで図２２（ａ），（ｂ），（ｃ）はそれぞれ斜視図、正面図、断面図を示している。

【０００４】また、図２３（ａ），（ｂ）は上記コイル部品を発展させたコイル部品のそれぞれ分解斜視図および斜視図を示している。同図において、上記第１、第２の巻線１，２を組合わせたものに絶縁のため円筒形に形成したフィルム４を挿入し、さらにテープ５によって絶縁された磁心６を挿入してコイル部品を形成しており、７は上記第１の巻線１、第２の巻線２からなる１組のコイルが回転するのを防止するための接着剤である。

【０００５】さらに、図２４（ａ），（ｂ）は上記図２３のコイル部品をケースに挿入したコイル部品のそれぞれ分解斜視図および斜視図を示している。同図において、上記コイル部品８をケース９に挿入し、１０はコイル部品８がケース９から脱落するのを防止するための接着剤である。

【０００６】

【発明が解決しようとする課題】しかしながら、上記図２２（ａ）～（ｃ）の構成においては１組のコイル部品を構成する第１の巻線１および第２の巻線２が共に円形であるため回転してしまいコイル引出し位置が定まら

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ず、そのため接着剤３でコイル引出し位置を固定するといった方法が必要となり、コストアップ、作業の複雑化の原因となっていた。

【０００７】また、この第１、第２の巻線１，２に磁心６を挿入してコイル部品を形成する際には、第１、第２の巻線１，２と磁心６間の絶縁が必要であるが、この絶縁物が厚いと第１、第２の巻線１，２の巻線径が大きくなり線長が長くなるため直流抵抗が増し通電時の温度上昇増加の原因となる。従って、従来は第１、第２の巻線１，２内にはポリエチレンフィルム等の薄いフィルム４を円筒形にして挿入し、磁心６にはテープ５を巻くといった手段がとられていた。このため作業が複雑になり、工程の自動化が不可能であった。また、上記第１の巻線１、第２の巻線２間は接着剤３により固定されているが、この１組の巻線１，２全体が磁心６に対して回転してしまうため、それを防止するためにも接着剤７を用いる必要があった。

【０００８】さらに、このコイル部品８をケース９に挿入する際には、磁心６にテープ５やフィルム４が巻かれているため嵌合構造を設けることが不可能であるため、コイル部品８のケース９に対する位置決めを行う作業や、コイル部品８の脱落防止および位置の固定のために接着剤１０が必要となり、コストアップ、作業の複雑化の原因となっていた。

【０００９】本発明は接着剤を用いず、作業も複雑化することなく巻線の回転防止、固定が行えるコイル部品を提供することを目的とするものである。

【００１０】

【課題を解決するための手段】上記課題を解決するために本発明のコイル部品は、円形ソレノイド状に巻回された第１の巻線と第２の巻線の少なくとも一部分の同位置に互いに接触するように巻線径より大きいＲの弧または直線部分を設けたものである。

【００１１】上記構成により２つのコイル間の回転がこの弧の部分により防止されることにより接着剤等を用いずに２つの巻線間のコイルの引出し位置が固定されるものである。

【００１２】

【発明の実施の形態】本発明の請求項１に記載の発明は、円形ソレノイド状に巻回された第１の巻線と第２の巻線の少なくとも一部分の同位置に互いに接触するように巻線径より大きいＲの弧または直線部分を設けたものであり、２つの巻線間の回転がこの弧または直線部分により防止されることにより接着剤等を用いずに２つの巻線間のコイルの引出し位置が固定されるものである。

【００１３】本発明の請求項２に記載の発明は、請求項１に記載の第１の巻線と第２の巻線を俵巻したものであり、２つの巻線より大きいＲの弧または直線部分がわずかでも回転防止が可能となる。さらに、上記第２の巻線を第１の巻線に密着させることで巻線内径が小さくなる

ことにより線長が短くなり直流抵抗が減少するため通電時の温度上昇が低減される。

【００１４】本発明の請求項３に記載の発明は、請求項１に記載の第１の巻線と第２の巻線の内側に挿入されるボビンと、このボビンの内側に挿入される磁心によって構成され、ボビンに２つの巻線のコイル引出し部分が同時に接触する回転方向に平行な平面を設けたものであり、２つの巻線間の回転のみならず、請求項１に記載の１組の巻線全体の回転も防止されることによりコイルの引出し位置が固定されるものである。

【００１５】本発明の請求項４に記載の発明は、請求項３に記載の第１、第２の巻線にボビンと磁心を組込んだものと嵌合するケースによって構成され、接着剤を用いずにコイル部品とケース間の固定が行われ、コイル部品のケースに対する位置決めが容易かつ正確に行えるものである。

【００１６】（実施の形態１）以下、本発明の実施の形態１について図１～図６を用いて説明する。図１は斜視図、図２は分解斜視図、図３は正面図、図４は断面図である。さらに図５はコイルを巻線するための巻治具の斜視図、図６は巻線の様子を示す図である。同図において１１は巻治具１２により円形ソレノイド状に巻回され一部分に巻治具１２の窪み１３により巻線径より大きいＲを持つ弧または直線部分１４が設けられた第１の巻線、１５は第１の巻線１１と同様に径の大きな巻治具１２により円形ソレノイド状に巻回され第１の巻線１１と同位置に巻治具１２の窪み１３により巻線径より大きいＲを持つ弧または直線部分１６が設けられた第２の巻線であり、それぞれのコイル端は巻線中心線に平行な方向に引き出されている。そして第１の巻線１１を第２の巻線１５内にそれぞれの弧または直線部分１４，１６が接触するように挿入しコイル部品が構成されている。

【００１７】従って、接着剤を用いず、作業も複雑化することなく上記の弧または直線部分１４，１６により２つの巻線１１，１５間での回転は防止され、２つの巻線１１，１５のコイル引出し位置は固定される。

【００１８】（実施の形態２）次に本発明の実施の形態２について図７、図８を用いて説明する。図７は斜視図、図８は正面図である。同図において実施の形態１と同様１１は円形ソレノイド状に巻回された第１の巻線、１５はその上に同じく円形ソレノイド状に巻回された第２の巻線であり、それぞれの巻線１１，１５には互いに接触するように巻線径より大きいＲを持つ弧または直線部分１４，１６が設けられている。そして各コイル端は巻線中心線に垂直な方向に引き出されている。

【００１９】従って、接着剤を用いず、作業も複雑化することなく上記の弧または直線部分１４，１６により２つの巻線１１，１５間での回転は防止され、２つの巻線１１，１５のコイル引出し位置は固定される。

【００２０】（実施の形態３）本発明の実施の形態３について図９～図１３を用いて説明する。図９は斜視図、図１０は正面図、図１１は断面図である。また図１２は第１の巻線の巻回の様子を示す図、図１３は第２の巻線の巻回の様子を示す図である。図１２において１１は巻治具１２によって円形ソレノイド状に巻回され一部分に巻治具１２の窪み１３により巻線径より大きいＲを持つ弧または直線部分１４が設けられた第１の巻線、図１３において１５はこの第１の巻線１１の上に重ねて俵巻された第２の巻線であり、第２の巻線１５に対して第１の巻線１１が巻治具の役割を果たすため第１の巻線１１と同様に第２の巻線１５にも巻線径より大きいＲを持つ弧または直線部分１６が設けられる。

【００２１】従って、上記の弧または直線部分１４，１６により２つの巻線１１，１５間の回転が防止されることに加え、巻治具１２を１個使用するのみでコイル部品が構成され作業が容易になり、２つの巻線１１，１５が俵巻されていることと巻線後のスプリングバックにより２つの巻線１１，１５間が密着され回転防止の効果は増す。

【００２２】さらに上記第２の巻線１５を第１の巻線１１に密着させることで巻線内径が小さくなることにより線長が短くなり直流抵抗が減少するため通電時の温度上昇が低減される。よって内側の第１の巻線１１の巻線径を増しても外側の第２の巻線１５の巻線径の増加が抑えられるため通電時の温度上昇の増加を防止することも可能となる。

【００２３】（実施の形態４）本発明の実施の形態４について図１４、図１５を用いて説明する。図１４は分解斜視図、図１５は同斜視図である。同図において１１，１５は第１、第２の巻線、１７は第１、第２の巻線１１，１５を組合せたものの内側に挿入される成型品からなるボビン、１８はそのボビン１７の内側に挿入されるUの字突き合わせ型、またはU・Iの字突き合わせ型（図示しない）の磁心であり、ボビン１７は肩幅を磁心１８より広くすることにより片側２ヵ所のコイル引出し部分が同時に接触する回転方向に平行な平面が設けられている。

【００２４】従って、ボビン１７を用いることにより巻線１１、磁心１８間の絶縁が容易に行えることに加え、２つの巻線１１，１５間の回転のみならず、請求項１に記載の１組のコイル部品全体の回転も防止されコイルの引出し位置が固定されるものである。

【００２５】さらに、請求項２に記載のコイル部品を使用することにより、従来の絶縁用フィルムに比べて厚いボビン１７を使用して内側の第１の巻線１１の巻線径が増加しても外側の第２の巻線１５の巻線径の増加が抑えられるため通電時の温度上昇の増加を防止することが可能となる。

【００２６】（実施の形態５）本発明の実施の形態５について図１６、図１７を用いて説明する。図１６は分解

斜視図、図１７は同斜視図である。同図において１１，１５は第１、第２の巻線、１７は第１、第２の巻線１１，１５を組合せたコイル部品の内側に挿入されるボビン、１８はそのボビン１７の内側に挿入されるＥの字突き合わせ型、またはＥ・Ｉの字突き合わせ型（図示しない）の磁心であり、ボビン１７には磁心１８に沿って片側２ヵ所のコイル引出し部分が同時に接触する回転方向に平行な平面１９が設けられている。

【００２７】従って、実施の形態４と同様成型品のボビン１７を用いることにより巻線・磁心間の絶縁が容易に行えることに加え、２つの巻線１１，１５間の回転のみならず、請求項１に記載の１組のコイル部品全体の回転も防止されコイルの引出し位置が固定されるものである。

【００２８】さらに、請求項２に記載のコイル部品を使用することにより、従来の絶縁用フィルムに比べて厚い成型品のボビン１７を使用して内側の第１の巻線１１の巻線径が増加しても外側の第２の巻線１５の巻線径の増加が抑えられるため通電時の温度上昇の増加を防止することが可能となる。

【００２９】（実施の形態６）本発明の実施の形態６について図１８、図１９を用いて説明する。図１８は分解斜視図、図１９は同斜視図である。同図において２０は実施の形態４に記載のコイル部品、２１はコイル部品２０のボビン１７の四隅に嵌合するフック２２を持つケースである。

【００３０】従って、接着剤等を用いずにコイル部品２０をケース２１内に固定することができ、ケース２１に対するコイル部品２０およびコイル引出し位置も容易かつ正確に固定される。

【００３１】（実施の形態７）本発明の実施の形態７について図２０、図２１を用いて説明する。図２０は分解斜視図、図２１は同斜視図である。同図において２０は実施の形態４のコイル部品、２１はコイル部品２０のボビン１７に各磁心１８を突き合わせ方向に押さえる方向にフック２２を設け嵌合するケースである。

【００３２】従って、実施の形態６と同様接着剤等を用いずにコイル部品２０をケース２１内に固定することができ、ケース２１に対するコイル部品２０およびコイル引出し位置も容易かつ正確に固定されることに加え、嵌合用のフック２２により２つの磁心１８を突き合わせることができる。

【００３３】

【発明の効果】以上のように本発明のコイル部品は、円形ソレノイド状に巻回された第１の巻線とその上に巻線された第２の巻線において、それぞれ巻線の少なくとも一部分の同位置に互いに接触するように巻線径より大きいＲを持つ弧または直線部分を設けた構成により、接着剤等を用いずにコイルの引出し位置を固定できるものである。

【００３４】さらに、上記巻線の巻回方法に加えて２つの巻線を俵巻することにより、２つの巻線が密着しているため弧や直線部分がわずかでも回転防止が可能となる。そして上記第２の巻線を第１の巻線に密着させることで巻線内径が小さくなることにより線長が短くなり直流抵抗が減少するため通電時の温度上昇が低減される。

【００３５】次に、２つの巻線を組合せたコイル部品の内側に挿入され２つの巻線のコイル引出し部分が同時に接触する回転方向に平行な平面を設けたボビン、ボビンの内側に挿入される磁心によってコイル部品を構成することにより、２つの巻線間の回転のみならず、１組のコイル部品全体の回転も防止されコイルの引出し位置が固定されるものである。

【００３６】さらに、上記コイル部品と嵌合するケースによってコイル部品を構成することにより、接着剤を用いずにコイル部品とケース間の固定が容易かつ正確に行われるものである。さらに上記嵌合部品をコイル部品の各磁心を突き合わせ方向に押さえる方向に設けた構成にすることにより、２つの磁心を突き合わせることができるものである。

【図面の簡単な説明】

【図１】本発明のコイル部品の一実施の形態における斜視図

【図２】同分解斜視図

【図３】同正面図

【図４】同断面図

【図５】同実施の形態における巻治具の斜視図

【図６】同巻線の様子を示す図

【図７】同他の実施の形態における斜視図

【図８】同正面図

【図９】同他の実施の形態における斜視図

【図１０】同正面図

【図１１】同断面図

【図１２】同巻線の様子を示す図

【図１３】同巻線の様子を示す図

【図１４】同他の実施の形態における分解斜視図

【図１５】同斜視図

【図１６】同他の実施の形態における分解斜視図

【図１７】同斜視図

【図１８】同他の実施の形態における分解斜視図

【図１９】同斜視図

【図２０】同他の実施の形態における分解斜視図

【図２１】同斜視図

【図２２】（ａ）従来のコイル部品の斜視図（ｂ）同正面図（ｃ）同断面図

【図２３】（ａ）同従来のコイル部品の分解斜視図（ｂ）同斜視図

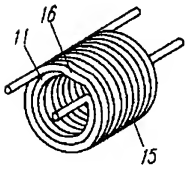
【図２４】（ａ）同従来のコイル部品の分解斜視図（ｂ）同斜視図

【符号の説明】

7　　8

１１　第１の巻線
１２　巻治具
１３　窪み
１４　巻線径より大きいＲを持つ弧または直線部分
１５　第２の巻線
１６　巻線径より大きいＲを持つ弧または直線部分
＊１７　ボビン
１８　磁心
１９　平面
２０　コイル部品
２１　ケース
＊　２２　フック

【図１】



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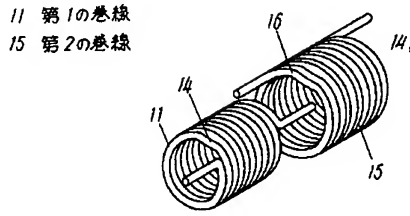

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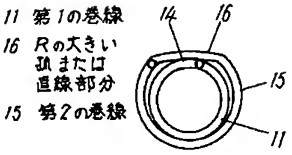

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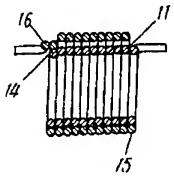

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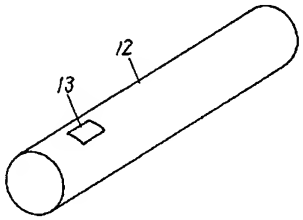

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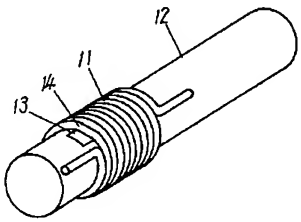

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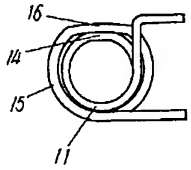

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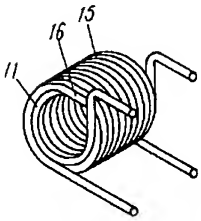

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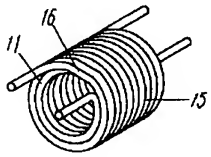

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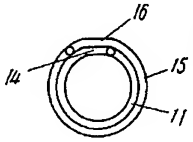

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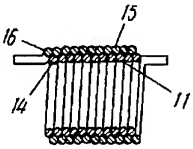
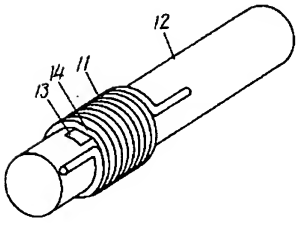
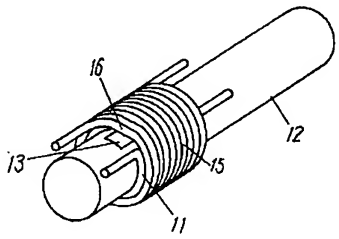


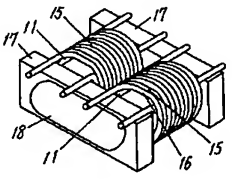
【図１３】

【図１５】

【図１２】







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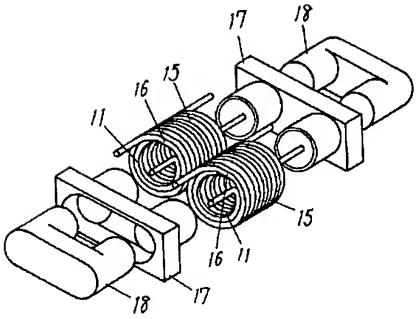

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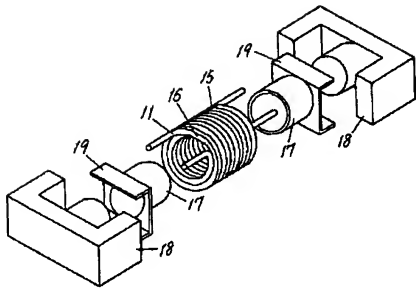

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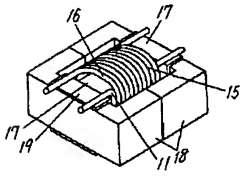

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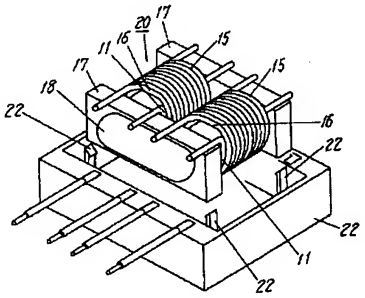

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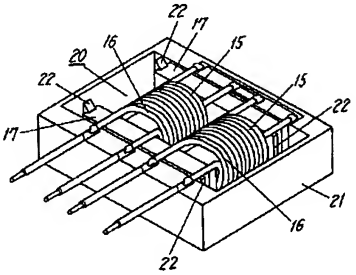

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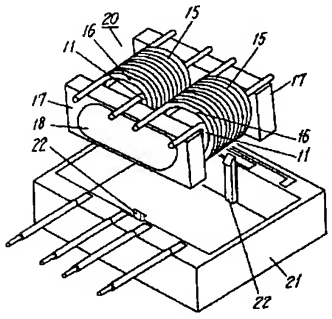

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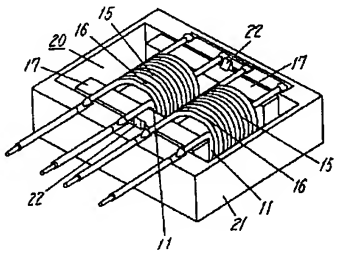

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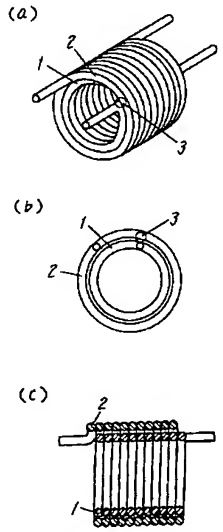

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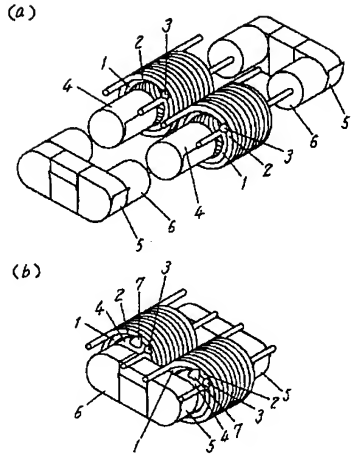

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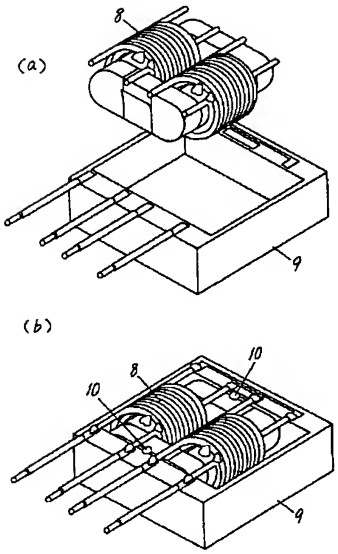

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Bibliography

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Epitome

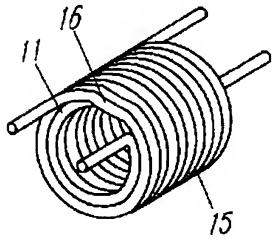
(57) [Abstract]

[Technical problem] This invention aims at fixing the cash-drawer location of a coil, without using adhesives etc. about a coil component in the circular solenoid coil by which the bifilar wound was carried out.

[Means for Solution] In the 1st coil 11 wound in the shape of a circular solenoid, and the 2nd coil 15 wound on it, the cash-drawer location of a coil can be fixed by constituting the coil component which prepared the arc or the straight-line parts 14 and 16 which have larger R than the diameter of a coil so that some [at least] homotopics of a coil may be contacted mutually, respectively, without using adhesives etc.

[Translation done.]

11 第1の巻線
15 第2の巻線



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2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] The coil component which consists of the 2nd coil which prepared the 1st coil which prepared the arc or straight-line part which is wound in the shape of a circular solenoid, and has larger R than a coil at least in a part, the arc which has larger R than the diameter of a coil so that it may be wound on this 1st coil and the 1st arc or straight-line part of a coil may be contacted, or the straight-line part.

[Claim 2] The coil component according to claim 1 which ****(ed) the 2nd coil on the 1st coil.

[Claim 3] The coil component which consists of a core which is inserted inside the 1st coil and the 2nd coil according to claim 1, and is inserted inside the bobbin which established the flat surface where the coil cash-drawer part of the two above-mentioned coils is parallel to the hand of cut in contact with coincidence, and this bobbin.

[Claim 4] The coil component which becomes the 1st and 2nd coil according to claim 3 from a bobbin, the thing incorporating a core, and the case that fits in.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the coil component used for a noise filter etc.

[0002]

[Description of the Prior Art] Drawing 22 , drawing 23 , and drawing 24 explain a Prior art.

[0003] First, according to drawing 22 (a), (b), and (c), it is 1 set of coil components constituted by the 2nd coil 2 by which the coil was carried out to the shape of a circular solenoid the same on the 1st coil 1 by which the coil was carried out to the shape of a circular solenoid, and 3 is the adhesives for preventing rotation between the 1st and 2nd coil 1 and 2. Drawing 22 (a), (b), and (c) show the perspective view, the front view, and the sectional view here, respectively.

[0004] moreover, each of a coil component into which drawing 23 (a) and (b) developed the above-mentioned coil component -- the decomposition perspective view and the perspective view are shown. The film 4 formed in the cylindrical shape in this drawing for the insulation to what combined the 1st and 2nd coil 1 and 2 of the above is inserted, the core 6 further insulated on the tape 5 is inserted, the coil component is formed, and 7 is the adhesives for preventing that 1 set of coils which consist of the 1st coil 1 of the above and the 2nd coil 2 rotate.

[0005] furthermore, each of the coil component with which drawing 24 (a) and (b)

inserted the coil component of above-mentioned drawing 23 in the case -- the decomposition perspective view and the perspective view are shown. In this drawing, the above-mentioned coil component 8 is inserted in a case 9, and 10 is the adhesives for preventing that a coil component 8 is omitted from a case 9.

[0006]

[Problem(s) to be Solved by the Invention] However, since the 1st coil 1 and 2nd coil 2 which constitute 1 set of coil components in the configuration of above-mentioned drawing 22 (a) - (c) were [both] circular, it rotated, and a coil cash-drawer location did not become settled, therefore the method of fixing a coil cash-drawer location with adhesives 3 was needed, and it had become the cause of complication of a cost rise and an activity.

[0007] Moreover, in case a core 6 is inserted in this 1st and 2nd coil 1 and 2 and a coil component is formed, it needs to be insulated between the 1st and 2nd coil 1 and 2 and a core 6, but since the diameter of a coil of the 1st and 2nd coil 1 and 2 will become large and line length will become long if this insulating material is thick, direct current resistance increases and it becomes the cause of the increment in a temperature rise at the time of energization. Therefore, conventionally, the thin films 4, such as a polyethylene film, were used as the cylindrical shape, and were inserted into the 1st and 2nd coil 1 and 2, and means to roll a tape 5 were taken in the core 6. For this reason, the activity became complicated and automation of a process was impossible. Moreover, although fixed by adhesives 3 between the 1st coil 1 of the above, and the 2nd coil 2, since 1 set of these coils 1 and the 2 whole rotated to a core 6, adhesives 7 needed to be used also in order to prevent it.

[0008] Furthermore, since it was impossible to establish fitting structure since the tape 5 and the film 4 are wound around the core 6 in case this coil component 8 is inserted in a case 9, adhesives 10 were needed for the activity which performs positioning to the case 9 of a coil component 8, omission prevention of a coil component 8, and immobilization of a location, and it had become the cause of complication of a cost rise and an activity.

[0009] This invention aims at offering the coil component which can perform rotation prevention of a coil, and immobilization not using adhesives, without also complicating an activity.

[0010]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, the coil component of this invention prepares the arc or straight-line part of larger R than the diameter of a coil so that some [at least] homotopics of the 1st coil wound in the shape of a circular solenoid and the 2nd coil may be contacted mutually.

[0011] When rotation between two coils is prevented by the part of this arc by the above-mentioned configuration, the cash-drawer location of the coil between two coils is fixed without using adhesives etc.

[0012]

[Embodiment of the Invention] Invention of this invention according to claim 1 prepares the arc or straight-line part of larger R than the diameter of a coil so that some [at least] homotopics of the 1st coil wound in the shape of a circular solenoid and the 2nd coil may be contacted mutually. The cash-drawer location of the coil between two coils is fixed by preventing rotation between two coils by this arc or the straight-line part, without using adhesives etc.

[0013] Invention of this invention according to claim 2 **** the 1st coil and 2nd coil according to claim 1, and even when the arcs or straight-line parts of large R are fewer than two coils, the rotation prevention of it is attained. Furthermore, when a coil bore becomes small by sticking the 2nd coil of the above to the 1st coil, in order that line length may become short and direct current resistance may decrease, the temperature rise at the time of energization is reduced.

[0014] The bobbin with which invention of this invention according to claim 3 is inserted inside the 1st coil and the 2nd coil according to claim 1, It is constituted by the core inserted inside this bobbin, and a flat surface parallel to the hand of cut where the coil cash-drawer part of two coils contacts a bobbin at coincidence is established. The cash-drawer location of a coil is fixed by preventing not only

the rotation between two coils but rotation of 1 set of whole coils according to claim 1.

[0015] It is constituted by the 1st and 2nd coil according to claim 3 in a bobbin, the thing incorporating a core, and the case that fits in, immobilization between a coil component and a case is performed, without using adhesives, and invention of this invention according to claim 4 can be performed easily [positioning to the case of a coil component], and correctly.

[0016] (Gestalt 1 of operation) The gestalt 1 of operation of this invention is hereafter explained using drawing 1 - drawing 6 . For drawing 1 , a perspective view and drawing 2 are [a front view and drawing 4 of a decomposition perspective view and drawing 3] sectional views. The perspective view of a volume fixture for drawing 5 to carry out the coil of the coil furthermore and drawing 6 are drawings showing the situation of a coil. The 1st coil with which the arc or the straight-line part 14 which 11 is wound in the shape of a circular solenoid with the volume fixture 12 in this drawing, and has larger R than the diameter of a coil in a part by the hollow 13 of the volume fixture 12 was prepared, 15 is the 2nd coil with which the arc or the straight-line part 16 which is wound in the shape of a circular solenoid with the big volume fixture 12 of a path like the 1st coil 11, and has larger R than the diameter of a coil in the 1st coil 11 and homotopic by the hollow 13 of the volume fixture 12 was prepared. Each end winding is pulled out in the direction parallel to a coil center line. And the 1st coil 11 is inserted so that each arc or the straight-line parts 14 and 16 may contact in the 2nd coil 15, and the coil component is constituted.

[0017] Therefore, not using adhesives, the rotation between two coils 11 and 15 is prevented by an above-mentioned arc or the above-mentioned straight-line parts 14 and 16, without also complicating an activity, and the coil cash-drawer location of two coils 11 and 15 is fixed.

[0018] (Gestalt 2 of operation) The gestalt 2 of operation of this invention is explained below using drawing 7 and drawing 8 . Drawing 7 is a perspective view and drawing 8 is a front view. The arc or the straight-line parts 14 and 16 which

have larger R than the diameter of a coil so that it may be the 1st coil around which 11 was wound in the shape of a circular solenoid like the gestalt 1 of operation in this drawing, and the 2nd coil around which 15 was wound in the shape of a circular solenoid the same on it and each coil 11 and 15 may be contacted mutually are prepared. And each end winding is pulled out in the direction perpendicular to a coil center line.

[0019] Therefore, not using adhesives, the rotation between two coils 11 and 15 is prevented by an above-mentioned arc or the above-mentioned straight-line parts 14 and 16, without also complicating an activity, and the coil cash-drawer location of two coils 11 and 15 is fixed.

[0020] (Gestalt 3 of operation) The gestalt 3 of operation of this invention is explained using drawing 9 - drawing 13 . Drawing 9 is [a front view and drawing 11 of a perspective view and drawing 10] sectional views. Moreover, drawing in which drawing 12 shows the situation of winding of the 1st coil, and drawing 13 are drawings showing the situation of winding of the 2nd coil. The 1st coil with which the arc or the straight-line part 14 which 11 is wound in the shape of a circular solenoid with the volume fixture 12 in drawing 12 , and has larger R than the diameter of a coil in a part by the hollow 13 of the volume fixture 12 was prepared, In order that 15 may be the 2nd coil ****(ed) in piles on this 1st coil 11 and the 1st coil 11 may play the role of a volume fixture to the 2nd coil 15 in drawing 13 , the arc or the straight-line part 16 which has larger R than the diameter of a coil in the 2nd coil 15 as well as the 1st coil 11 is prepared.

[0021] Therefore, in addition to rotation between two coils 11 and 15 being prevented by an above-mentioned arc or the above-mentioned straight-line parts 14 and 16, a coil component only consists of using one volume fixture 12, an activity becomes easy, it is stuck to between two coils 11 and 15 by the springback after that two coils 11 and 15 are ****(ed) and a coil, and the effectiveness of rotation prevention increases.

[0022] When a coil bore becomes small by furthermore sticking the 2nd coil 15 of the above to the 1st coil 11, in order that line length may become short and direct

current resistance may decrease, the temperature rise at the time of energization is reduced. Therefore, since the increment in the diameter of a coil of the 2nd outside coil 15 is suppressed even if it increases the diameter of a coil of the 1st inside coil 11, it also becomes possible to prevent the increment in the temperature rise at the time of energization.

[0023] (Gestalt 4 of operation) The gestalt 4 of operation of this invention is explained using drawing 14 and drawing 15 . Drawing 14 is a decomposition perspective view and drawing 15 is this perspective view. The bobbin which consists of a cast inserted inside although 11 and 15 combined the 1st and 2nd coil and 17 combined the 1st and 2nd coil 11 and 15 in this drawing, 18 is the core of the character comparison mold of U inserted inside the bobbin 17, or the character comparison mold (not shown) of U-I. When a bobbin 17 makes the breadth of its shoulders larger than a core 18, the flat surface where the coil cash-drawer part of two one side is parallel to the hand of cut in contact with coincidence is established.

[0024] Therefore, by using a bobbin 17, in addition to the ability to perform the insulation between a coil 11 and a core 18 easily, not only the rotation between two coils 11 and 15 but rotation of 1 set of coil entire components according to claim 1 is prevented, and the cash-drawer location of a coil is fixed.

[0025] Furthermore, by using a coil component according to claim 2, since the increment in the diameter of a coil of the 2nd outside coil 15 is suppressed even if the diameter of a coil of the 1st inside coil 11 increases using the thick bobbin 17 compared with the conventional film for an insulation, it becomes possible to prevent the increment in the temperature rise at the time of energization.

[0026] (Gestalt 5 of operation) The gestalt 5 of operation of this invention is explained using drawing 16 and drawing 17 . Drawing 16 is a decomposition perspective view and drawing 17 is this perspective view. The bobbin inserted inside the coil component with which 11 and 15 combined the 1st and 2nd coil, and 17 combined the 1st and 2nd coil 11 and 15 in this drawing, 18 is the core of the character comparison mold of E inserted inside the bobbin 17, or the

character comparison mold (not shown) of E-I, and the flat surface 19 where the coil cash-drawer part of two one side is parallel to the hand of cut in contact with coincidence is established in the bobbin 17 along the core 18.

[0027] Therefore, by using the bobbin 17 of a cast like the gestalt 4 of operation, in addition to the ability to perform the insulation between a coil and a core easily, not only the rotation between two coils 11 and 15 but rotation of 1 set of coil entire components according to claim 1 is prevented, and the cash-drawer location of a coil is fixed.

[0028] Furthermore, by using a coil component according to claim 2, since the increment in the diameter of a coil of the 2nd outside coil 15 is suppressed even if the diameter of a coil of the 1st inside coil 11 increases using the bobbin 17 of a thick cast compared with the conventional film for an insulation, it becomes possible to prevent the increment in the temperature rise at the time of energization.

[0029] (Gestalt 6 of operation) The gestalt 6 of operation of this invention is explained using drawing 18 and drawing 19 . Drawing 18 is a decomposition perspective view and drawing 19 is this perspective view. It is a case with the hook 22 by which 20 fits into a coil component given in the gestalt 4 of operation, and 21 fits into the four corners of the bobbin 17 of a coil component 20 in this drawing.

[0030] Therefore, a coil component 20 can be fixed in a case 21, without using adhesives etc., and it is fixed easily [the coil component 20 and coil cash-drawer location to a case 21], and correctly.

[0031] (Gestalt 7 of operation) The gestalt 7 of operation of this invention is explained using drawing 20 and drawing 21 . Drawing 20 is a decomposition perspective view and drawing 21 is this perspective view. It is the case which forms hook 22 in the direction which 20 presses down each core 18 to the coil component of the gestalt 4 of operation, and presses down 21 in the comparison direction in the bobbin 17 of a coil component 20 in this drawing, and fits into it.

[0032] Therefore, a coil component 20 can be fixed in a case 21, without using

adhesives etc. like the gestalt 6 of operation, and, in addition to being fixed easily [the coil component 20 and coil cash-drawer location to a case 21], and correctly, two cores 18 can be compared by the hook 22 for fitting.

[0033]

[Effect of the Invention] The coil component of this invention can fix the cash-drawer location of a coil in the 1st coil wound in the shape of a circular solenoid, and the 2nd coil by which the coil was carried out on it by the configuration which prepared the arc or straight-line part which has larger R than the diameter of a coil so that some [at least] homotopics of a coil may be contacted mutually, respectively as mentioned above, without using adhesives etc.

[0034] Furthermore, by ****(ing) two coils in addition to the winding approach of the above-mentioned coil, since two coils have stuck, even when an arc and straight-line parts are few, rotation prevention is attained. And when a coil bore becomes small by sticking the 2nd coil of the above to the 1st coil, in order that line length may become short and direct current resistance may decrease, the temperature rise at the time of energization is reduced.

[0035] Next, by constituting a coil component by the core inserted inside [which established the flat surface parallel to the hand of cut where it is inserted inside the coil component which combined two coils, and the coil cash-drawer part of two coils contacts coincidence] a bobbin and a bobbin, not only the rotation between two coils but rotation of 1 set of coil entire components is prevented, and the cash-drawer location of a coil is fixed.

[0036] Furthermore, immobilization between a coil component and a case is performed easily and correctly by constituting a coil component in the above-mentioned coil component and the case which fits in, without using adhesives. Two cores can be compared by furthermore making the above-mentioned fitting components the configuration which established each core of a coil component in the direction pressed down in the comparison direction.

[Translation done.]

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3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The perspective view in the gestalt of 1 operation of the coil component of this invention

[Drawing 2] Isomerism solution perspective view

[Drawing 3] This front view

[Drawing 4] This sectional view

[Drawing 5] The perspective view of the volume fixture in the gestalt of this operation

[Drawing 6] Drawing showing the situation of this coil

[Drawing 7] The perspective view in the gestalt of operation of ****

[Drawing 8] This front view

[Drawing 9] The perspective view in the gestalt of operation of ****

[Drawing 10] This front view

[Drawing 11] This sectional view

[Drawing 12] Drawing showing the situation of this coil

[Drawing 13] Drawing showing the situation of this coil

[Drawing 14] The decomposition perspective view in the gestalt of operation of ****

[Drawing 15] This perspective view

[Drawing 16] The decomposition perspective view in the gestalt of operation of ****

[Drawing 17] This perspective view

[Drawing 18] The decomposition perspective view in the gestalt of operation of ****

[Drawing 19] This perspective view

[Drawing 20] The decomposition perspective view in the gestalt of operation of ****

[Drawing 21] This perspective view

[Drawing 22] (a) The (perspective view b) said (front view c) said sectional view of the conventional coil component

[Drawing 23] (a) The decomposition (perspective view b) said perspective view of the coil component of ******

[Drawing 24] (a) The decomposition (perspective view b) said perspective view of the coil component of ******

[Description of Notations]

11 1st Coil

12 Volume Fixture

13 Hollow

14 Arc or Straight-Line Part with Larger R than Diameter of Coil

15 2nd Coil

16 Arc or Straight-Line Part with Larger R than Diameter of Coil

17 Bobbin

18 Core

19 Flat Surface

20 Coil Component

21 Case

22 Hook

[Translation done.]

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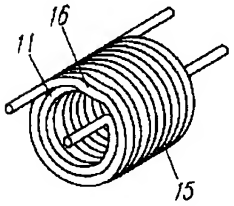
DRAWINGS

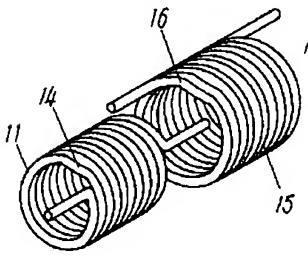
[Drawing 1]

11 第1の巻線
15 第2の巻線



[Drawing 2]

11 第1の巻線
14,16 Rの大きい弧または直線部分
15 第2の巻線



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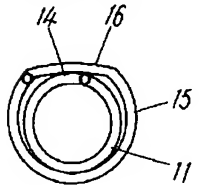

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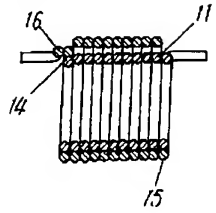
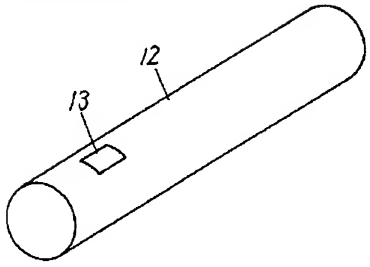
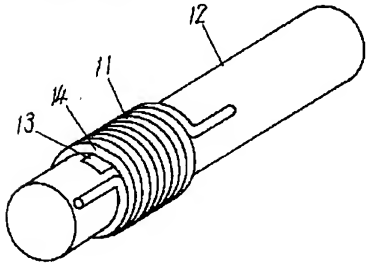


[Drawing 5]



[Drawing 6]



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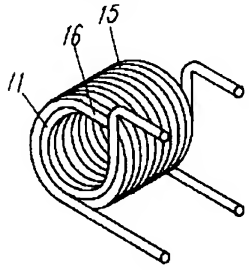

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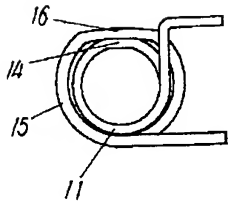

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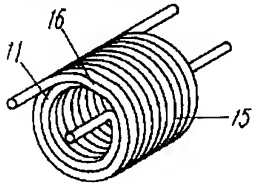
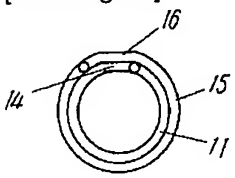
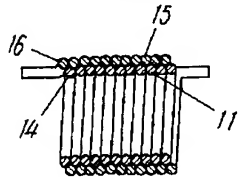


[Drawing 10]



[Drawing 11]



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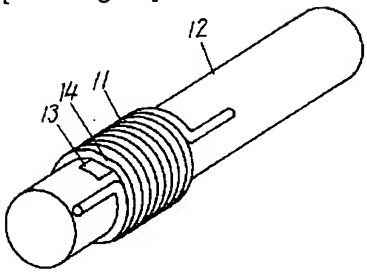
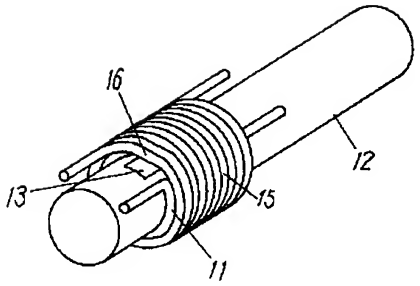


[Drawing 13]



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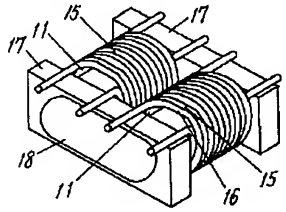
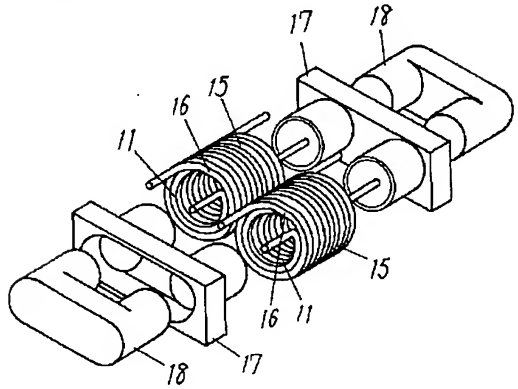
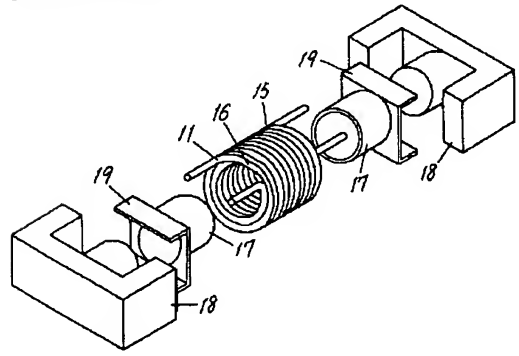


[Drawing 14]



[Drawing 16]



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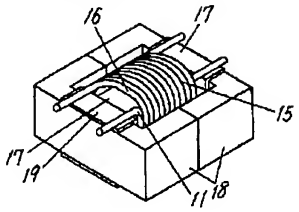

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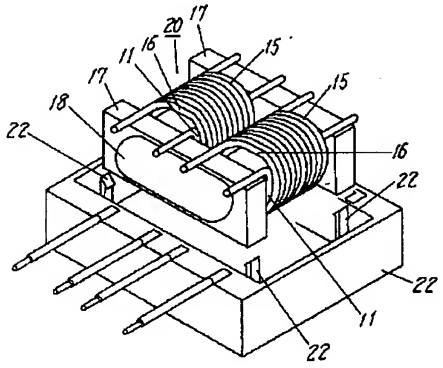

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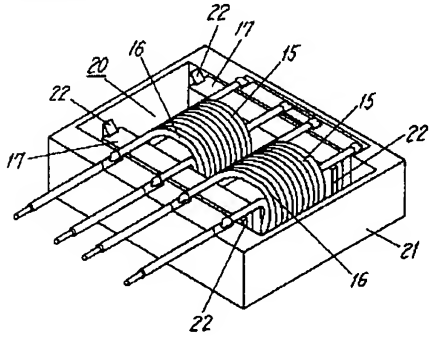

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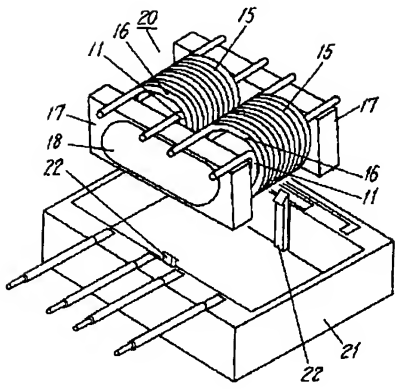

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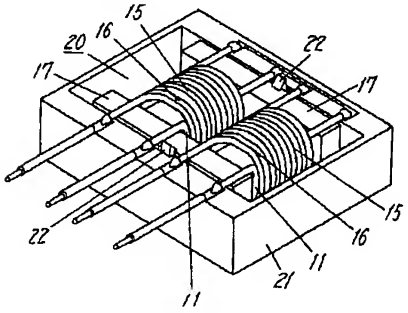

[Drawing 22]

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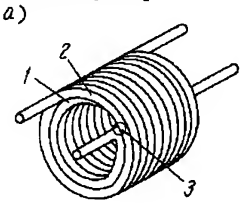

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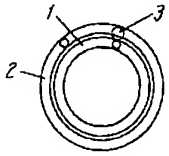

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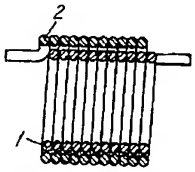
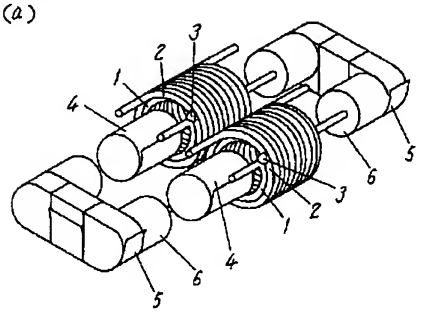


[Drawing 23]

(a)



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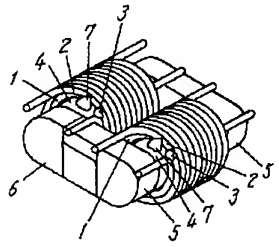

[Drawing 24]

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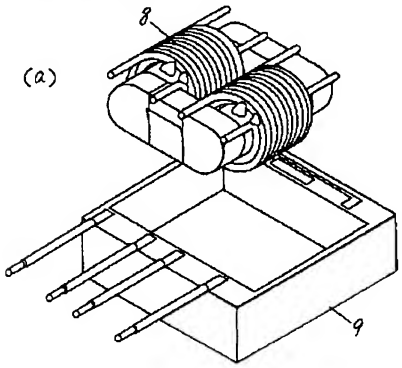

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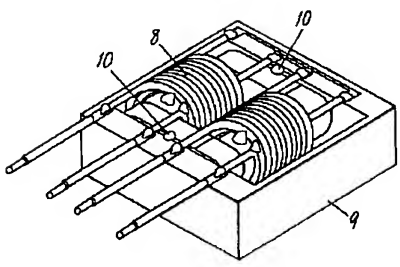

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